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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/685,042	10/10/2000	Shuichi Kobayashi	35.G2657	3110

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EXAMINER

CHANG, AUDREY Y

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 09/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/685,042

Applicant(s)

KOBAYASHI, SHUICHI

Examiner

Audrey Y. Chang

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6-8 and 11-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6-8 and 11-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 30 May 2002 is: a) ☐ approved b) ☒ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on May 30, 2002, which has been entered as paper number 8.
- By this amendment, the applicant has amended claims 1,3-4, and 6-8, has canceled claims 2, 5, 9 and 10 and has newly added claims 11-16.
- Claims 1, 3-4, 6-8 and 11-16 remain pending in this application.
- The rejection to claims 2 and 5 under 35 USC 112, second paragraph, set forth in the previous Office Action are withdrawn in response to applicant's amendment.

Allowable Subject Matter

1. The indicated allowability of subject matters recited in claim 9 is withdrawn in view of the newly discovered reference(s) to *Ogata et al* (PN. 6,097,547). Rejections based on the newly cited reference(s) follow.

Drawings

2. The proposed drawing correction filed on May 30, 2002 has been *disapproved* because it is not in the form of a pen-and-ink sketch showing changes in red ink or with the changes otherwise highlighted. See MPEP § 608.02(v).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 11-12 and 14-15 are rejected under 35 U.S.C. 102(b) as being anticipated by the patent issued to Ushida et al (PN. 5,636,000).

Ushida et al teaches a *projection optical system* that is comprised of a *layered diffraction optical system* laminated with *diffraction optical elements* (G_1 and G_2) wherein the layered diffraction optical system is placed *behind* an *aperture stop element* (element 25 in Table 2) or *iris* of the projection optical system. Ushida et al teaches that the first diffraction optical element has a *positive* power and the second diffractive optical element has *negative* power, (please see column 6, Figures 1-2). With regard to claim 12, Ushida et al teaches that the first diffractive optical element is made of glass material such as *quartz* and the second diffractive optical element is made of glass material such as *fluorite* wherein quartz and fluorite have *different wavelength dispersion property*, (please see column 6, lines 24-29). With regard to claim 14, it is implicitly true that the diffractive optical elements have high diffraction efficiency in the intended wavelength range. With regard to claim 15, the projection optical system comprises other lenses that serve as refractive optical device, (please see Figure 2). This reference has therefore anticipated the claims.

Claim Rejections - 35 USC § 103

5. Claims 1, 3-4, and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Ogata et al (PN. 6,097,547).

Ogata et al teaches an *optical system* having a *front converter lens system* (CL) placed *in front* of an *iris* or *aperture stop* wherein the lens system comprises a double convex lens, which is a *positive* lens,

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having a *diffractive* surface facing the subject side and a double concave lens, which is a *negative* lens, having a *diffractive* surface facing the subject side, (please see Figure 8). Ogata et al teaches that the diffractive surface on the positive lens is having *positive power* and the diffractive surface on the negative lens is having *negative power*, (please see column 6, lines 33-36).

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the two diffractive optical elements are laminated to form a layered diffraction optical device. However such modification is an obvious matter of design choice to one skilled in the art since to have the diffractive optical elements laminated together to form one optical system or to have them as separated elements really does not affect the function of the diffractive optical elements.

With regard to claim 3, Ogata et al teaches that the two diffractive optical elements are made with materials of different wavelength dispersion property, namely they have different Abbe number, (please see column 13). With regard to claim 4, there is an air space separation between the two diffractive optical elements, (please see Figure 8). With regard to claims 6 and 8, Ogata et al teaches that the lens system is designed to operate in visible wavelength range. With regard to claim 7, Ogata et al teaches that the optical system further comprises other lens groups, which serve as the refractive optical devices.

6. Claims 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Ushida et al.

The projection optical system taught by Ushida et al as described for claim 11 above has met all the limitations of the claims. This reference however does not teach explicitly that the diffractive optical elements are laminated with an air layer interposed. However such modification is either implicitly included since the diffraction optical elements have stair case profile as shown in Figures 2 and 3 which makes them necessary to have air space between the two elements or an obvious modification to one skilled in the art to achieve desired diffraction/refraction property, by interposing an refractive air

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medium. With regard to claim 16, this reference does not teach explicitly that the wavelength intended for operation is visible range, however since using visible light in projection system is very standard practice in the art such modification is considered to be obvious to one skilled in the art.

Response to Arguments

7. Applicant's arguments with respect to claims 1, 3-4, and 6-8 have been considered but are moot in view of the new ground(s) of rejection.

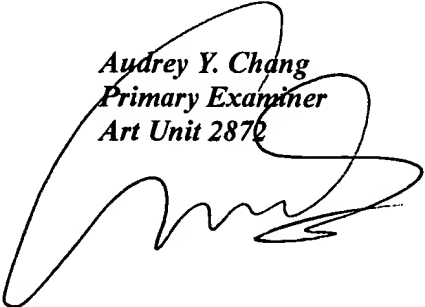
8. The newly submitted claims 11-16 have been fully considered and they are rejected for the reasons stated above.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Audrey Y. Chang
Primary Examiner
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A. Chang, Ph.D.
September 11, 2002